REMARKS

In the last Office Action, the Examiner rejected claims 7-9 and 14 under 35 U.S.C. §112, second paragraph, for indefiniteness. Claims 1, 7-10 and 17 were rejected under 35 U.S.C. §102(e) as being unpatentable over U.S. Patent No. 6,094,293 to Yokoyama et al. ("Yokoyama"). Claims 1-3, 5-6 and 17 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,805,759 to Fukushima. Claims 1-3 and 6 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,407,838 to Canoglu et al. in view of U.S. Patent No. 6,498,682 to Glance. Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Fukashima in view of Galgiridi et al. ("Galgiridi") ("Optical Communications", second edition by Galgiridi et al., John Wiley & Sons, 1995, pp. 56-59). Claims 11-12, 14 and 16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Yokoyama in view of U.S. Patent No. 6,469,421 to Wakabayashi et al. ("Wakabayashi"). Claims 10-12 and 14 were rejected under 35 U.S.C. §103(a) as being unpatentable over Fukushima in view of Wakabayashi. Claim 13 was rejected under 35 U.S.C. §103(a) as being unpatentable over Yokoyama in view of U.S. Patent No. 6,034,466 to Blanding et al. ("Blanding"). Claim 15 was rejected under 35 U.S.C. §103(a) as being unpatentable over Yokoyama et al. in view of U.S. Patent No. 6,144,140 to Iino et al. ("Iino").

In accordance with the present response, the specification has been suitably revised to correct informalities, provide antecedent basis for the claim language, and bring it into better conformance with U.S. practice. Original claims 1-17 have been replaced with new claims 18-32, 36 to further patentably distinguish from the prior art of record, overcome the indefiniteness rejection, improve the wording, and bring them into better conformance with U.S. practice. New claims 33-35 and 37-53 have been added to provide a fuller scope of coverage. The title of the invention has been changed to "OPTICAL COMMUNICATION DEVICE AND METHOD OF CONTROLLING OPTICAL COMMUNICATION DEVICE" to more clearly reflect the invention to which the new claims are directed. A new, more descriptive abstract has been substituted for the original abstract. Submitted herewith is a replacement sheet for Fig. 9B incorporating a revision to label the optical communication device 4.

In view of the foregoing, applicants respectfully submit that the rejection of the original claims under 35 U.S.C. §112, second paragraph, has been overcome and should be withdrawn.

Applicants respectfully request reconsideration of their application in light of the following discussion.

Brief Summary of The Invention

The present invention is directed to an optical communication device and to a method of controlling the optical communication device.

As described in the specification, (pages 1-2), conventional optical communication devices have poor operational reliability and do not meet the current demand for optical communication devices having a compact structure.

The present invention overcomes the drawbacks of the conventional art. Figs. 1-4 show an embodiment of an optical communication device 1 according to the present invention embodied in the claims. The optical communication device 1 has an optical system 10, 10a, 10b for propagating a light beam 100 along a light beam path, optical parts 21 disposed on opposite sides of the light beam path, driving means 22 for independently driving each of the optical parts 21 between a first position in which the corresponding optical part intersects the light beam path (e.g., see position of the optical part 21 intersecting the light beam path in Fig. 2B) and a second position in which the corresponding optical part does not intersect the light beam path (e.g., see position of each optical part 21 which does not intersect the light beam path in Fig. 2B), and driving control means for controlling the drive means to independently drive each of the optical parts 21 between the first and second positions.

Preferably, the optical parts 21 comprise at least two different types of optical parts, such as optical parts having different wavelength transmission characteristics, different wavelength absorption characteristics, or different light amount transmitting characteristics. The driving means preferably comprises piezoelectric actuators each for independently driving a respective one of the optical parts 21 between the first and second positions. The piezoelectric actuators and corresponding optical parts are preferably arranged in a zig-zag pattern (see Fig. 2B) on opposite sides of the light beam path.

By the foregoing construction, the optical communication device has excellent operational reliability and is more compact as compared to conventional optical communication devices.

The prior art of record does not disclose or suggest the subject matter recited in newly added claims 18-53.

New independent claim 18 is directed to an optical communication device and requires an optical system for propagating a light beam along a light beam path, a plurality of optical parts disposed on opposite sides of the light beam path, driving means for independently driving each of the optical parts between a first position in which the corresponding optical part intersects the light beam path and

a second position in which the corresponding optical part does not intersect the light beam path, and driving control means for controlling the drive means to independently drive each of the optical parts between the first and second positions. No corresponding structural combination is disclosed or suggested by the prior art of record.

For example, Fukushima discloses an optical equalizer having variable wavelength characteristics. As shown in the embodiment of Fig. 9, for example, the optical equalizer has optical parts in the form of attenuator plates 6. A driver 32' includes a mechanism for displacing the optical parts 6(#1 to #4) in the Z axis direction from a position in which the optical parts intersect a light beam path of a spectral beam SP to a position in which the optical parts 6 do not intersect the light beam path. However, Fukushima does not disclose or suggest that the optical parts are disposed on opposite sides of the light beam path, as required by new independent claim 18. Stated otherwise, the optical parts 6 in Fukushima are disposed on only one side, not on opposite sides, of the optical path (i.e., in Fig. 9 the driver 32' and corresponding optical parts 6(#1 to #4) are arranged only below the spectral beam SP).

New independent claim 18 similarly patentably distinguishes from Yokoyama and Canoglu. In Yokoyama, optical

parts 2A-2D are movable to positions in which they do and do not intersect a light beam propagated by optical fibers 60A-60D (Fig. 4B). However, like in the apparatus disclosed by Fukushima, the optical parts 2A-2D of Yokoyama are disposed on only one side of a light beam path (i.e., only on the right side in Fig. 4B), not on opposite sides of the light beam path path, as recited in independent claim 18. Likewise, as shown in Fig. 1 of Canoglu, optical members 28-34 are disposed on only one side of a path of a light beam propagated by an optical fiber 22 (i.e., only on the left side in Fig. 1), not on opposite sides of the light beam path, as recited in independent claim 18.

New claims 19-36 depend on and contain all of the limitations of independent claim 18 and, therefore, distinguish from the prior art of record at least in the same manner as claim 18.

Moreover, there are separate grounds for patentability of several of the dependent claims.

Claims 19-22 include the additional limitations that the plurality of optical parts comprises at least two different types of optical parts (claim 19), at least two of the plurality of optical parts have different wavelength transmission characteristics (claim 20), at least two of the plurality of optical parts have different wavelength

absorption characteristics (claim 21), and at least two of the plurality of optical parts have different light amount transmitting characteristics (claim 22). No corresponding features are disclosed or suggested by the prior art of record.

Claim 25 includes the additional limitation that the driving devices and corresponding optical members are arranged in a zig-zag pattern on opposite sides of the light beam path. No corresponding positional relationship is disclosed or suggested by the prior art of record. For example, while the optical parts 2A-2D in Yokoyama are arranged in a zig-zag pattern relative one another, the optical parts are not arranged in a zig-zag pattern on opposite sides of the light beam path, as recited in claim 25.

New independent claim 37 is also directed to an optical communication device and requires at least one first optical member disposed on a first side of the light beam path, the at least one first optical member having a first optical part for undergoing movement between a first position in which the first optical part intersects the light beam path and a second position in which the first optical part does not intersect the light beam path. Claim 37 further requires at least one second optical member disposed on a second side of the light beam path opposite the first side thereof, the at

least one second optical member and having a second optical part for undergoing movement between a first position in which the second optical part intersects the light beam path and a second position in which the second optical part does not intersect the light beam path. The prior art of record does not disclose or suggest first and second optical members disposed on opposite sides of the light beam path, as recited in claim 37, as set forth above for independent claim 18.

New independent claim 49 is also directed to an optical communication device and requires a plurality of independent optical members arranged in a zig-zag pattern on opposite sides of the light beam path, each of the optical members having an optical part and driving means for driving the optical part between a first position in which the optical part intersects the light beam path and a second position in which the optical part does not intersect the light beam path. No corresponding positional relationship between the optical members and light beam path is disclosed or suggested by the prior art of record as set forth above for independent claim 18.

New claims 38-48 and 50-53 depend on and contain all of the limitations of independent claims 37 and 49, respectively, and, therefore, distinguish from the prior art of record at least in the same manner as claims 37 and 49.

In view of the foregoing amendments and discussion, the application is believed to be in allowable form. Accordingly, favorable reconsideration and allowance of the claims are most respectfully requested.

Respectfully submitted,

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